MARINE REVIEW.

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Lake Superior Iron Company's Steamers.

In the following table details are given of the performance of the six steel steamers of the Lake Superior Iron Company during the season of 1894. The boats are practically duplicates, 266 feet long, and have duplicate engines of the triple expansion type, the cylinders being 17, 29 and 47 inches diameter and 36 inches stroke, two boilers in each case supplying steam at 160 pounds pressure:

PERFORMANCE OF LAKE SUPERIOR COMPANY'S STEAMERS.

	LA SALLE.	JOLIET.	WAWATAM.	GRIFFIN.	ANDASTE.	CHOCTAW.
Total miles traveled	30,702	29,536	34,635	33,150	31,571	29,147
Number of trips made	23	23	27	25	23	23
Number of cargoes carried	28	27	32	29	29	30
Av. length of trip, miles	1,335	1,284	1,246	1,326	1,373	1,268
Gross tons ore carried	49,145	48,252	54,474	50,753	54,615	50,541
Net tons coal carried	11,253	8,033	11,658	9,085	9,462	14,969
Av. s eed per hr. light, miles	11.05	11.27	12.14	11.62	12.32	12.23
Av. speed per hr. loaded, "	10.33	10.99	10.82	11.13	11.08	11.68
Total tons of fuel used	2,661	2,836	2,702	3,096	2,668	2,566
Av. amt. fuel p'r mile, pounds	173	192	156	187	169	176
Av. cost of fuel p'r mile, cents	21.6	23.8	18.9	22.7	20.7	22.0
Engineers' repairs, supplies	$918.16	$808.05	$299.03	$643.03	$291.46	$383.29
Av. cost of oils per mile	80/100 cts.	85/100 cts.	37/100 cts.	95/100 cts.	85/100 cts.	87/100 cts.
Av. size cargo ore, gross tons.	2,258 E. / 2,131 M.	2,098 M.	2,217 E. / 2,010 M.	..... / 2,030 M.	2,163 M. / 2,433 E.	2,160 M. / 2,591 E.
	D. H. M.	D. H. M.	D. H. M.	H. D. M.	D. H. M.	D. H. M.
Av. time h'ndl'g cargo, actual	26-26	27-04	23-09	27-57	27-24	27-56
Actual time sailing	120-13-52	110-19-06	127-07-51	121-18-57	113-18-06	102-07-28
Actual time in port	85-05-08	85-06-26	91-13-18	96-23-33	99-22-56	105-19-02
Actual time in commission	205-19-00	196-01-32	218-21-09	218-18-30	213-17-02	208-02-30
Av. time per trip	8-22-44	8-12-48	8-02-34	8-18-01	9-07-00	9-01-09

M—Marquette; E—Escanaba.

The Lake-Atlantic Canal Commission.

As it is probable that Senator Vilas' measure providing for the appointment of an inter-national commission to investigate matters of survey, treaty regulations, etc., pertaining to a deep waterway between the lakes and the Atlantic, will be passed before the adjournment of the present congress, considerable interest attaches to the provisions of the resolution. The resolution directs the president to appoint three persons, one of whom may be an engineer of the United States army, who shall have power to meet and confer with any other similar committee which may be appointed by the government of Great Britain, or of the Dominion of Canada, and who shall make inquiry and report whether it is feasible to build such canals as shall enable vessels engaged in ocean commerce to pass to and fro between the great lakes and the Atlantic ocean, with an adequate and controllable supply of water for continual use, where such canals can be most conveniently located; also the probable cost of same, with estimates in detail; and if any part of the same should be built in the territory of Canada, what regulations or treaty arrangements will be necessary between the United States and Great Britain to preserve the free use of such canals to the people of this country at all times, and all necessary facts and considerations relating to the construction and future use of deep water channels between the great lakes and the Atlantic ocean. The persons so appointed shall serve without compensation.

A Lesson in the Manchester Canal.

The people of Pittsburg, who have refused to listen to reasonable argument regarding the impracticability, from a commercial standpoint, of the proposed Lake Erie–Ohio river ship-canal, will find in late official reports from Manchester, England, some facts about the operation of the Manchester canal that are positive enough to demand consideration. The proposition to make a lake city of Pittsburg, by the construction of a canal to Lake Erie, is, of course, coupled with even more disadvantages than the Manchester undertaking, which has proved conclusively that ship-canals are only successful when they connect great bodies of water, affording long water hauls on either side.

During the first year of operation the Manchester canal has failed to pay any interest whatever upon the millions invested in it, and in earnings is even short of operating expenses. On the last day of 1894 the canal had been open for traffic for a full period of twelve months. The approximate returns for the time under consideration show that the merchandise in sea-going vessels and barges represented a total tonnage of 925,659, yielding a revenue of about $386,000. Adding to these figures the small sums arising from ships' dues, and the receipts from passengers and cattle, the total amount for the year is found to be $437,350. The result is so disappointing, that the most constant supporters of the waterway feel more than anxious as to its future. The earnings of the canal are not only insufficient to meet the working expenses, but are barely equal to provide for the interest on 4 per cent. first debentures, which will absorb more than $360,000. Besides this, there is interest to pay on a loan of $25,000,000 from the city of Manchester, and some return for the benefit of $40,000,000 held by ordinary and preference shareholders. At a moderate computation, the working expenses can not be much less than $510,000, so that, putting to one side all payment of interest, there will be a deficit of some $75,000 upon the year's working.

Better Than Thirty-three Miles an Hour.

An issue of Engineering of London, just at hand, gives particulars of the trial of the torpedo boat chaser Boxer. The Boxer is the fourth of the vessels of this type built by J. I. Thornycroft & Co., and each have in turn beaten the record and are now the four fastest ships in the world. Names of the other three are Daring, Decoy and Ardent. In the trial of this latest vessel, six runs were made over the measured mile with the following results:

Time. Min.	Time. Sec.	Speed knots.	Revolutions, starboard.	Revolutions, port.
2	2.6	29.364	425.7	400.3
2	4.4	28.939	420.5	419.6
2	1.4	29.654	415.1	407.7
2	9	27.907	408.3	406.0
1	58.6	30.354	418.3	411.8
2	9.8	27.735	411.4	410.0

The mean speed during three hours' running, as measured by the total number of revolutions made, was 29.17 knots, the total distance covered in that time being 100.6 statute miles. This speed exceeds that ever obtained on an official trial by more than a knot.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store and afloat at the principal points of accumulation on the lakes on Feb. 9, 1895:

	Wheat, bushels. In store.	Wheat, bushels. Afloat.	In store.	Afloat.
Chicago	25,516,000	1,434,000	4,270,000	1,322,000
Duluth	9,519,000	85,000	2,000	.....
Milwaukee	746,000	.....	.....	.....
Detroit	1,312,000	257,000	106,000	.....
Toledo	2,829,000	337,000	1,007,000	.....
Buffalo	3,812,000	314,000	143,000	684,000
Total	43,734,000	2,427,000	5,528,000	2,006,000

New District Judge for Chicago.

All indications now are for an additional United States district judge at Chicago. The district court there is so overburdened with general business that marine and patent cases drag along to a most unreasonable length. It is Judge Grosscup's desire to have an associate to relieve him of both admiralty and patent cases, and if the bill becomes a law this division of work will be followed. Marine men who know of the ability of Charles E Kremer, the Chicago admiralty lawyer, have joined in recommending his appointment. Both the bench and bar at Chicago have united in the same request. It will be a great advantage to lake interests to have a district judge at Chicago who has an accurate knowledge of vessel affairs. For seven years Mr. Kremer, as referee, has passed upon more cases than have been passed upon by the United States court. The bill giving an additional judge is likely to pass both houses of congress next week.

In a letter to the Coast Seaman's Journal, organ of the Seaman's Union, Secretary Elderkin of that organization says: "An attempt will be made on the lakes at an early date to form an organization embracing all kinds of maritime workers. I believe that something effective will be accomplished in this direction before the season begins. The iron industry and, in fact, general transportation promises to be fairly active in the summer. As sailing vessels are fast disappearing from the lakes, the future of our organization lies with the steamboat men. In this direction there is a great sphere for improvement, both in the men themselves and in the laws governing them."

Material for Hulls of Ships.

Editor MARINE REVIEW—An article discussing the relative merits of acid and basic open hearth steel, which recently appeared in the MARINE REVIEW, contains some errors which I would like to have space in your columns to point out, as a matter of correct information to others, who, like myself, are interested in the subject. In the first place, however, I agree fully with the author of the article in question, that "ship owners and ship builders are alive to the necessity of using only the best of materials in hull construction," and that every effort is being put forth on their part to bring this about. But I can not agree with him in the conclusion which he draws that this end can be attained only by restricting the steel employed to that made by the acid open hearth process. I have had considerable practical experience with the steel made by both methods, the acid and basic, and in consequence have as great confidence in the latter as in the former.

The leading points sought to be made in the article under review, are, first, that the basic open hearth process is a new and untried one, recently resorted to for the purpose of obtaining, at a reduced cost, an open hearth steel suitable for ship plates. Secondly, that basic open hearth steel is inferior to the acid open hearth, for the alleged reason that a cheaper class of raw materials is used in its production. While it is true that the basic process is a comparatively new one in this country, it has nevertheless been in successful operation at some mills for a number of years in the production of plates for boiler and other purposes, in which it had made for itself a recognized place long before its use for hull construction in ships was contemplated, which has only been within the past year or two. On the other hand, however, the process has been practiced for many years in Europe, where it has a firmly established and high reputation as a first class steel. Exhaustive investigations of it were made by the admiralties of the leading European countries—France, Belgium, Germany, Austria and Russia—which proved in every case that it is fully as good as the acid open hearth, and in a number of cases the results obtained were actually better, so that it has been uniformly adopted, a fact, which in itself, would seem to be conclusive proof of its merit. It is particularly worthy of consideration that our own government is freely using this steel in the construction of its new navy, and it is a well known fact that the government requirements are of the most rigid and severe character, which could not be fulfilled by steel other than the best.

As regards the second point, that in its manufacture the grades of raw material used are poorer than those used in the acid process, I must, without wishing to question the integrity of any steel maker, flatly contradict this statement, which can not be substantiated, as the following facts will show: In the acid open hearth process materials are selected which are sufficiently free from phosphorus and sulphur to produce the desired results in the finished material. It is a well known fact, which I think the acid steel maker will admit, that his process will not eliminate any of the phosphorus and sulphur impurities contained in the melting stock, and that, in fact, the finished product will contain a higher percentage of these impurities than did the average of the raw materials used, owing to the phosphorus and sulphur being taken up by the metal and the oxidation of the silicon, iron, etc., making the weight of the steel produced less than the weight of the charge. The manufacturer therefore takes these facts into consideration and selects his raw materials accordingly. The procedure of the basic manufacturer is precisely the same, and he is forced to use the best grades of materials when the requirements of the finished product are such as are met in specifications for boiler and ship plates. But there are reasons why basic open hearth steel is even more reliable than the acid. It is generally recognized that phosphorus and sulphur are the impurities which cause the most trouble in steel making and working, and since it is impossible to remove them by the acid process it is certain that all these impurities contained in the raw materials will be found in the finished steel. The basic process being essencially a refining one, these impurities are to a large extent removed, leaving the steel purer chemically.

In view of these facts, and with carelessly drawn specifications as to the quality of the steel, I would certainly prefer to trust the basic open hearth, because of the greater facility with which the lower phosphorus and sulphur can be obtained. The writer of the article in your journal refers to certain instances where basic steel has failed without apparent cause, and immediately draws the conclusion that this was due to the fact that it was basic, as if anyone who knows anything about steel making would pretend to claim that like cases have not happened with acid steel. The claim that basic steel is being generally excluded by the best engineers is at variance with the statistics, which will show rather the reverse, and that much more of basic steel has been used in bridge and similar structures than acid steel, within the few years in which open hearth steel has been used for this work. I realize fully that bad steel can be made by any process, and in this I again agree with the author of the article, and would like to impress upon the minds of consumers of ship material the importance of carefully considered specifications, which will require a mrterial sufficiently low in phosphorus and sulphur to insure purity, chemically, as well as physical requirements that will produce proper tensile strength and ductility. With these precautions and careful testing the consumer need not be afraid of open hearth steel by whatever process made, and without them he should be suspicious of any material, whether iron or steel.

Cleveland, Feb. 12, 1894. A SUBSCRIBER.

Another Company to Raise the Pewabic.

Editor MARINE REVIEW: In the REVIEW of Jan. 24, I notice you refer to the A. P. Pichereau company making inquiries with a view to raising the sunken steamer Pewabic. Our inquiries have been sufficiently answered, thanks to Capt. Geo. P. McKay of your city and others interested, and we now have before us the work of first procuring sufficient funds for the enterprise, and then to have our skilled engineers accomplish the work, which can surely be accomplished, landing the Pewabic with her valuable cargo in port within the next five months at a cost somewhere between $5,000 and $10,000. Engineering has been in the line of progress, like other trades and professions, and we see nothing to prevent us recovering a heavy steamer like the Pewabic from the bottom of Lake Michigan, even though she is below 120 feet of water and has been down for thirty years. THE A. P. PICHEREAU COMPANY,

No. 163 Randolph street,
CHICAGO, ILL.

Operation of the Cleveland-Cliffs Steamers.

Owing to several errors that crept into the following item as printed in last week's issue, we are constrained to reproduce the matter with proper corrections:

Through the kindness of Mr. J. H. Sheadle, secretary of the Cleveland-Cliffs Iron Company, the REVIEW is enabled to present in the table that follows some interesting data relative to the operation of that company's steel steamers during the season of 1894. Particulars of the boats, their engines and boilers are contained in the following paragraphs:

Pontiac—Hull, 320 feet over all, 300 feet keel, 40 feet beam, 25 feet moulded depth; engines, triple expansion, 24, 38 and 61 by 42 inches; boilers, three, Scotch type, 11.5 by 14 feet, allowed 160 pounds steam.

Frontenac—Hull, 289 feet over all, 271 feet keel, 39.6 feet beam, 24 feet moulded depth; engines, triple expansion, 20, 31 and 52 by 40 inches; boilers, two, Scotch type, 11.5 by 14 feet, allowed 150 pounds steam.

Pioneer—Hull, 241 feet over all, 225 feet keel, 35 feet beam, 17.5 feet moulded depth; engines, triple expansion, 20, 33, and 54 by 42 inches; boilers, two, Scotch type, 12 feet diameter and 11.5 feet long, allowed 160 pounds steam and fitted with Howden system of hot draft.

Cadillac—Hull, 244 feet over all, 230 feet keel, 37 feet beam, 19 feet moulded depth; engines, 15, 25 and 42 by 36 inches; one boiler, 13 by 11.5 feet, allowed 160 pounds steam.

PERFORMANCE OF STEAMERS OF CLEVELAND-CLIFFS IRON COMPANY OF CLEVELAND, SEASON OF 1894.

	PONTIAC.	FRONTENAC.	PIONEER.	CADILLAC.
Days in commission	233	243	234	223
Days in port	68	79	66	80
Days sailing	147½	140	155	124
Days lost by bad weather	7½	7	4	12½
Days lost by accidents	.....	7	½	½
Days waiting at "Soo" canal	10	10	8½	6
Trips made	27	24	37	22
Cargoes carried	31	27	41	28
Gross tons freight carried	74,188	59,452	63,406	54,181
Miles run	43,395	38,331	47,144	30,598
Miles run per hour	12.27	11.42	12.71	10.34
Net tons fuel used	4,323	3,738	4,021	1,881
Average pounds fuel per mile	199	195	170	123
Cost lubricants per mile	42/100 ct.	61/100 ct.	50/100 ct.	54/100 ct.

A remarkable feature of the foregoing statement is the number of trips made by the Pioneer. She made thirty-seven trips, carrying up loads on four of them. Three of the trips were to the head of Lake Superior and all others to Marquette. Three of the cargoes of coal were taken to Marquette and one to Detour. The Pioneer unloaded twenty-eight cargoes at the Cleveland & Pittsburgh dock, Cleveland, a number of times obtaining the fast plant, when she was unloaded in from 6½ to 8 hours. Her number of trips is undoubtedly greater than that of any other boat in the ore trade.

From Kenosha, Wis., the death of Capt. John Tuttle is announced. Capt. Tuttle was eighty-three years of age. His sailing was in early days.

Making Big Claims for the New York.

Admiral Meade, commanding the North Atlantic squadron, and Capt. Robley D. Evans of the cruiser New York, have sent reports to the navy department making big claims for the performance of the New York on a trial which occurred Jan. 12 while that vessel was en route from New York to Hampton Roads. Admiral Meade's endorsement on Capt. Evans' report is very flattering to the cruiser. It reads: "Approved and forwarded, except that I do not agree with Capt. Evans as to the ship's probable speed of 22 knots. I think 21 knots the very outside limit, and that with the ship's present force could not be sustained for many hours, owing to the difficulty of serving rapidly the furnace fires."

The official report of Captain Evans is as follows: "I have the honor to state that on Jan. 12, 1895, I gave the U. S. S. New York, under my command, a full speed, natural draught trial, and submit the following report: The bottom of the ship was clean, she having been recently painted at the New York navy yard. The weather was clear and cold, with light, variable winds, mostly from east to southeast. The sea was smooth, with a long and at times heavy ground swell from the eastward. The engines were started ahead and gradually worked up to full speed at 10 a. m., when near the Sandy Hook light-ship. A course southeast was steered, in order to get deep water as soon as possible. When twenty-five miles off shore the course was changed to southwest by south, and the run continued until 8 p. m., when we were up with Winter Quarter shoal. The average speed for the run was 18 knots, the maximum being 19.6. The machinery worked well in all parts, and the fire-room force was ample for the purpose. The fire-rooms were cool and the men seemed to enjoy the work. The swell was of such a nature that she took water over her stern and onto the forecastle deck in small quantities, enough only to keep her forward deck wet. The run of the coal from the bunkers was used as directed by regulations, and no assistance from the deck force was found necessary in handling the same. The coal used caused considerable clinker, and after four hours it was found impossible to remove the clinker from the back of the furnaces, as the slide bars would slide up over it. The fronts were kept clear. With Pocahontas coal and similar conditions I believe the New York could maintain an average speed of 19 knots under natural draught and probably 22 knots under forced draught. In my opinion the trial above recorded demonstrates that the New York is, beyond question, the fastest vessel of her class in the world and thoroughly capable of doing the work for which she was designed. I assure the department that I feel deeply the honor of such a command."

Passed-Assistant Engineer F. J. Schell also made a report on the performance of the engines during the trial. His report reads: "I have the honor herewith to transmit the data of the trial of this vessel, made on the 12th inst., and to make the following report: The period covered was from 11 a. m. to 8 p. m. During this time half-hourly observations were made as far as possible. The average indicated horse power for the main engines is 7,180.78. The collective indicated horse power for the main engines, air and circulating pumps is 7,212.78. In obtaining the average for the main engines, the cards were taken as a basis, as the revolutions of the engines then approached the average number quite closely. The horse power of each cylinder was increased in the ratio of the cubes of the revolutions for the average indicated horse power. The following auxiliaries, in addition to air and circulating pumps, were in use: One electric light engine, one ice machine, four ventilating engines, one flushing pump, three main feed pumps, four engine room bilge pumps, one auxiliary condenser, one steering engine. A portion of the fire room blowers were run by direction of Chief Engineer Lowe during the first part of the trial; those in No. 1 fire room, where the draught was poor, on account of the ventilators being masked by a screen on the bridge, were run until 2 p. m. The horse power of the auxiliaries was estimated partly from the data of the contractors' official trial and partly from indicator cards taken at various times. It is not practicable to indicate them during the trial. Bituminous coal of good quality was used. The average amount of coal burned per hour was 7.85 tons. Taking this average speed at 18 knots, this gives 2.29 knots per ton of coal."

CAPTIVE LOOKOUT BALOON ON BOARD A FRENCH BATTLESHIP.

Captive Baloons on the War Vessels.

France is the home of the captive baloon. An illustration on this page shows the utilization of a captive baloon on board the French naval vessel Formidable, while stationed at Toulon, where numerous ascensions were made with results that are said to warrant the continuance of experiments. The aim is, of course, to extend the visible horizon for strategic purposes. The REVIEW is indebted to the American Engineer and Railroad Journal of New York for the engraving.

During the fiscal year ending June 30, 1894, the dominion government expended $1,640,483 on the St. Lawrence canals; $1,316,529 on the "Soo" canal; $3,412 on the Trent river works; $64,345 on the Lachine canal, and $1,571 on the Welland Canal.

A British View of the Submarine Boat Question.

The February issue of the Nautical Magazine contains an interesting article on submarine boats, which is based upon the action of the United States government in contracting for a boat of the Holland type, and also upon progress being made in Australia with the Seymour-Allen type of boat. The writer considers these late types of "infernal" machines distinct advances on anything in Europe, but deals with history in showing that submarine navigation has been a study of centuries without marked progress.

"Great Britain, Germany, France, Italy, and particularly the United States, have all tried their genius at boats of this description," he says, "but hitherto there have been many failures, and chiefly for the reason that when a little below the surface the most acute vision is seriously obscured by the necessary thickness of the glass through which it has to peer, and also by the somewhat cloudy condition of even the clearest water. In most experiments undertaken in Europe and America, it is doubtful if any operators have ever been able to see ahead of or around them for more than 20 feet, and often not more than 10 or 12 feet if the water be in the least thick; indeed, so much has this been the case that the British admiralty, after innumerable experiments, has in a great measure ceased to take much interest in submarine boats, when considering schemes of defence for naval harbors and dockyards. Though most European nations claim to have the very best and most formidable article of this kind all ready for use, it is very doubtful if any of their inventions would be able to succesfully attack a ship kept under way. Though speed and security to crew may ultimately be attained, it is possible that a very limited range of view will, for many years, be one of the chief difficulties of submarine navigation, and especially in the neighborhood or harbors and estuaries, where the water is invariably muddy. Certainly a boat might be constructed, capable of some sort of success, by appearing every few minates on the surface for a sight of her prey, but it is doubtful if any sane commander of a hostile ship or a fleet would ever come to an anchor in the neighborhood of any harbor where submarine boats were supposed to exist.

"Submarine boats in some shape or another were not only thought of but actually used at the siege of Tyre and also at Syracuse, more than two thousand years ago. But the inventive genius of the early Greek sailors died with their famous nation. There are numerous records of trials of boats of this kind in the sixteenth and seventeenth centuries. During the war with America in 1812 a submarine boat was got under the bottom of H. M. S. Ramillies lying at New London. On that occasion the flagship of Commodore Hardy had a very narrow escape, for the operator, whoever he was, attached his boat to her keel and succeeded in boring a hole through the copper when, being compelled to come up for air, he was discovered. An attempt was made to get Napoleon away from St. Helena in a boat designed by an English smuggler named Johnson, who was to have had £20,000 from certain French patriots in the event of his success. The death of the exile in 1821 put an end to this enterprise, when Johnson then appeared as an earnest defender of his country, and in such a guise offered his boat to the British government. She was tried on the Thames and went down into the bed of the river near Greenwich, where she remained 'four hours with six people on board without inconvenience.'

"Many submarine inventions were brought out during the American civil war. In nearly all cases they were the attempts of the confederates to blow up federal ships, and not till after many terrible disasters and much loss of life, was a first success obtained. This attack was made against the new sloop-of-war Housatonic, then blockading Charlestown harbor, during the month of February, 1864. One night, about nine, the watch on deck saw something like a plank approaching the ship from the starboard bow. Being on their guard against infernal machines, an alarm was at once given and the cable slipped, but before the engines could be reversed the plank struck the ship abaft the main chains, and in the explosion which followed the ship quickly went down. One of the federal squadron succeeded in saving all hands but four, but when the war was over and the wreck examined, the confederate boat was found, with her crew of nine dead men, sticking in the hole which she had made in the side of the Housatonic. In this remarkable attack there was no such thing on board the ship as a search-light, and although many shots were fired by the guard on watch, nobody appears to have been hurt by bullets on board the torpedo, which actually came coolly alongside and remained there nearly a minute before descending for the attack. Singularly, the crew of the torpedo fired on the frigate and mortally wounded the officer of the watch, but being close alongside, no heavy gun could be sufficiently depressed to bear on her, and she consequently escaped all dangers except that fatal one of being sucked into the hole made by her own petard.

"Of British-built craft there have been great numbers. In regard to chemical compounds for purifying the internal air—all that is now an exploded theory, more perfect inventions having made it possible for enough compressed air being carried down to supply all desirable wants. In some of the latest boats built in Great Britain, submersion is effected by the admission of water, when verticle screws at each end, driven by separate engines, are operated for forcing the vessel to desired depth. The favorite motive power is electricity, some of the latest inventors alleging that they have overcome the original difficulties of insulating the accumulators. One of the latest French boats is the Gustave Zede, named after the man who produced the Gymnote and other craft for submarine purposes. She was laid down in October, 1890. Several trials have produced disappointing results for her inventors. Recently at Toulon, after alterations to her motors, she went down to a depth of seventeen metres, but in preparing for the descent got her propeller out of the water by plunging at an extreme angle, and this resulted in the engines flying off at a great rate and the crew losing their footing in and around the engine room. In addition to this they were found suffering from some affection of the throat caused possibly by a want ef pure air. Her extreme length is 131 feet, and her total cost to the French government £44,760."

Around the Lakes.

Improvements are being made in the plant of the Union Dry Dock Company of Buffalo, with a view to docking vessels of the largest size.

Since the loss of the Graham and Morton line steamer Chicora, talk of chartering the steamer City of Toledo for Lake Michigan service has been renewed.

Engines and boilers of the steamer George L. Colwell will be placed in the wooden hull being built by Alex. Anderson of Marine City for Jesse H. Farwell of Detroit.

Capt. Todd of Cleveland has the sympathy of a large circle of friends in the death of his son, Joseph D. Todd, Jr., a promising young man, who died at the family home, 118 Davis street, Cleveland, a few days ago.

On Friday, March 1, Col. Jared A. Smith, United States engineer corps, Cleveland, will open proposals for removing and rebuilding a part of the west pier at Fairport and for dredging in the straight channel through Maumee bay, Toledo.

Major M. B. Adams, light-house engineer in charge of all work on the lakes above Detroit, will open proposals in Detroit on March 2 for furnishing boilers for ten steam fog signals in sets of two, to be delivered at the light-house depot in Detroit.

The front tower on the east pier entrance to Fairport harbor, Lake Erie, has been moved 122 feet to the northward of its former position, and the light will, on the reopening of navigation, be exhibited at a point 21 feet from the outer end of the east pier.

Officers and directors of the American Steel Barge Company, elected in New York recently, are as follows: Colgate Hoyt, president; Frank Rockefeller, vice-president; R. C. Wetmore, secretary; Colgate Hoyt, treasurer; Colgate Hoyt, James C. Colgate, Henry C. Rouse, Samuel Mather, Charles L. Colby, Frank Rockefeller, Alexander McDougall, A. D. Thomson and Thomas Wilson, directors.

John Marron of the firm of Farasey & Marron, Cleveland, is engaged in organizing a company to construct a line of steel canal boats, to be towed for package freight and other business down Lake Erie and through the Erie canal. The aim is to carry on a trade of this kind without breaking freight at Buffalo, and it is thought that canal boats suited to weather conditions on Lake Erie can be constructed. The scheme has been talked of at intervals for several years past.

Officers of Marine Engineers Beneficial Association No. 9 of Milwaukee are as follows: Past-President, W. G. Fell; president, J. Collins; vice-president, C. Bendschneider; treasurer, F. Coons; financial secretary, J. Conway; corresponding secretary, C. Forsyth, No. 159 Milwaukee street; recording secretary, J. Desmond; chaplain, J. Staley; conductor, F. Whittier; door-keeper, E. Doucett. J. Collins represented the association at the national convention.

Capt. W. D. Robinson, originator of the Inland Lloyd's Register and for four years, from 1886 to 1890, supervising inspector of steam vessels with headquarters at Buffalo, died at his home in that city a few days ago. He was eighty seven years old. Capt. Robinson had been associated with lake marine interests all his life, being engaged during later years as an expert in insurance matters. Announcement is made in Detroit of the death of William N. Burton, who was also engaged in insurance matters, but who had sailed and had been owner of vessel property.

The Mitchell Steamship Company and the Mentor Steamship Company, controlling boats managed in the office of Mitchell & Co., Cleveland, have elected officers and directors as follows: Mitchell Steamship Company—President and general manager, Capt. John Mitchell; vice-president, Philip Morris; secretary, W. F. Sauber; treasurer, Capt. Alfred Mitchell; these with Thomas Fitzpatrick constitute the board of directors. Mentor Steamship Company—President and general manager, Thomas Fitzpatrick; vice-president, W. H. Barriss; secretary and treasurer, C. C. Hale; these with John Mitchell and G. B. Case constitute the board of directors.

All Self-Made Men.

F. W. Wheeler studied for the ministry.

Capt. C. E. Benham gave some time to the study of medicine.

C. A. Macdonald was trained for underwriting as he learned the alphabet.

Aaron Parker of Detroit scored his first success as a money-maker in the oil regions of Pennsylvania.

Not long ago, W. H. Cook of Palmer, Cook & Calbick, Chicago, made pills in a Michigan city drug store.

P. H. Fleming was the keen office boy of a firm of vessel brokers, and in time succeeded to their business.

E. J. Henry used to gather water front news at San Francisco, and double the Horn occasionally for a change.

George Uhler, national president of the Marine Engineers' Beneficial Association, was educated for the ministry.

Capt. James Millen obtained a start in vessel business through tugging on the Detroit river. His hobby now is fast horses.

Capt. George P. McKay was born afloat. He comes from a family of vessel masters, who were pioneers on Lake Superior.

Hugh MacMillan sailed before the mast with Capt. Bundy of gospel ship fame and has taken no stock since in that lake missionary.

T. T. Morford checked freight for the Union Steamboat Company, and did it so well that he became, before many years, its Chicago agent.

Charles E. Kremer, the Chicago admiralty lawyer, first saw boats at Oshkosh. Then he went to Milwaukee and studied law with Markham.

W. M. Egan sailed the lakes, and became an owner while still a boy. It is said he sat at the door of a masonic lodge, waiting to be old enough to be admitted.

Harvey Goulder, admiralty lawyer, sailed before the mast and gained a practical knowledge of navigation that has proven of great value to him in his profession.

J. J. H. Brown of Buffalo was sailing as late as 1876. His last boat was the Scotia. His partner, Ed. Smith, was the son of a shoemaker and began business as a grocer.

John Prindiville played with the original ten little Indian boys around Fort Dearborn. He is as young now as he was then, "Capt. John" having discovered the "elixir of youth."

H. A. Hawgood was a marine engineer, and saw a great many years of hard service before obtaining his first share in a vessel. P. P. Miller of Buffalo was also a lake engineer.

Among salt water sailors who have gained prominence on the lakes are W. P. Henry of the Lehigh Talley Transportation Company and General Manager Ricketson of the Inter-Ocean company, Milwaukee.

Capt. James Davidson of West Bay City began life as a ferry boy in Buffalo. He is now a millionaire and probably exercises more direct control over his many interests than any man of like wealth in this country.

B. L. Pennington's first occupation was that of a country school teacher. He was associated with Capt. John Palmer in the vessel brokerage business at a time when all shipping matters were conducted on the river in Cleveland.

Many of the best wooden vessels on the lakes in the fifties were built in Cleveland by E. M. Peck, who has seen some ups and downs in the financial world but who is now among the wealthiest and most highly respected citizens of Detroit.

Capt. John T. Hutchinson was a butcher and one of the first schooners he owned was called the Butcher Boy. The late Capt. Thomas Maytham of Buffalo was also a butcher in partnership with "Jack" Greening, a pioneer vessel owner of Cleveland.

H. J. Webb, pioneer vessel broker of the lakes, was a dry goods clerk in Cleveland from 1850 to 1855. In 1856 he originated the ship brokerage business. He has turned over two or three fortunes and is still comfortably supplied with this world's goods.

Congressman W. J. White, the millionaire of Yucatan gum fame, and also the owner of considerable vessel property, made and sold candy, popcorn and gum to small grocers in Cleveland as late as seven or eight years ago. He is also credited with having done some sailing.

J. S. Dunham ran away from home at every chance to be on the boats at Troy, N. Y. Then he came to Chicago as engineer of a tug. Next he took a tug to New Orleans, and when the rebellion broke out he owned two tugs at Mobile. He skipped to the north, and lost his boats.

W. C. Richardson sold groceries on the road and J. C. Gilchrist was sales agent for a Detroit tobacco firm. Both had previously seen the rough side of life aboard small vessels, Mr. Richardson graduating as mate and Mr. Gilchrist as clerk on Detroit river passenger boats.

Ex-President James Corrigan of the Lake Carriers' Association was before the mast with Capt. Wm. Mack and other well known Clevelanders, previous to joining his brother John in refining oil. Both managed to sell out to the Standard for a big slice of the valuable stock of that corporation.

About ten years ago Harry G. Dalton was checking cars on Cleveland docks for the firm of Pickands, Mather & Co. His management of affairs of that big firm to-day should command a salary equal to that of leading railway managers and there is little doubt of it being up in the thousands.

When a boy John Mitchell sold apples and other fruit in Milwaukee and his brother Al. was a bill poster. Not many years ago John Wedow, the third member of the firm of Mitchell & Co., was a drygoods clerk in a small Michigan town, and from force of habit he still carries a scissors in an upper vest pocket.

Capt. John Green, the Buffalo capitalist and vessel owner, better known to his friends as "Jack Green," was a fisherman. He was born in Canada. Crossing Lake Ontario to Lewiston, he walked to Buffalo and settled on the lake front. In the sixties as a tugman, he was conspicuous in the famous Fenian raid to Canada.

T. F. Newman, who controls the Cleveland and Buffalo Transit Company, was advanced from office boy with Agent Pierce of the Detroit and Cleveland Steam Navigation Company to the management of that company's affairs in Cleveland. He is still known among the older men in the vessel business as "Tommy" Newman.

Before he came to the states, as the Canadian would put it, Alex McVittie had a varied career in mercantile lines in Western Ontario. He entered the employ of what is now the Detroit Dry Dock Campany as time-keeper at a small salary, but fair weather has followed him through three changes of presidents in that institution.

John Bartow left home at thirteen and spent a short period at sea. He sold newspapers in Buffalo when a boy and profited by early associations with the Buffalo press club. Literature is his hobby, but few people who know him in business matters have even a faint idea of his knowledge of books and history. His memory is wonderful.

J. J. Hill, president of the Great Northern Railway and Northern Steamship Company, and familiarly known as "Jim" Hill, was at one time a section hand on the immense railway system which he controls. He is now several times a millionaire, lives in the finest mansion in St. Paul and has one of the best private art collections in America.

Capt. George Bone, the oldest vessel broker in Buffalo, was keeper of the beacon light-house at Erie before the war. He enlisted in the navy and was in command of the gunboat Silver Lake, of the Mississippi squadron, taking part in the second battle of Fort Donelson, Nashville, and others, which were fought on the Cumberland and vicinity.

Wilson's point, just below the Sault, is named for the family of which Capt. Thomas Wilson of Cleveland has been the most important figure in lake business. The family located there upon coming to this country from Scotland. Capt. Wilson began sailing when the number of ships on Lake Superior was very limited, and he was among the first men in command of lake passenger steamers.

Capt. John. W. Moore was a sturdy boy of the plow on a farm at Avon point, Lake Erie, but like Putnam of old he left it in the furrow and at a tender age risked his life at sea, shipping as cook on a scow for the munificent stipend of $5 a month. With him, now, all dates cease to be considered, excepting the year 1872, when his schooner Ely was caught in the ice at Grand island, Lake Superior, and was not released until the following June. As a weatherwise man he predicts an equally late opening for the coming season.

Capt. Frank Perew began to sail the lakes as a cook, shipping as a matter of bluff on a passing schooner that was without one, for he did not know the first rudiments of the business. They tell the famous rice story on Capt. Perew, where the green cook, on being told to boil some rice began by filling the kettle full of it and had to take out enough as it swelled to fill every dish to be found. Still the story has been so badly overworked that it is doubtful whether the captain can claim to have been the original hero of it.

Stephen Kirby, father of Frank E. Kirby, was a ship builder at East Saginaw. He represented Jesse Hoyt in the Saginaw country, and Frank's ability thus came directly under the observation and patronage of the millionaire. Frank Kirby obtained an engineering education at Cooper Institute and acquired his first practical experience at the Delamater Iron Works, New York. He was the protege of Capt. E. B. Ward, who was for years a leading steamboat owner on the lakes, and who established the iron ship building business at Wyandotte.

In the days when wealthy southern planters patronized Lake Superior passenger boats, L. C. Hanna of the firm of M. A. Hanna & Co., was a steamboat clerk, and John Pankhurst, Robert Wallace, Tom Coe, Thomas Fitzpatrick aud other ship builders and vessel owners of to-day were lake engineers. M. A. Hanna and H. M. Hanna were also passenger boat clerks. H. M. Hanna's nautical experience, which is genuine, was acquired in the navy with the gulf squadron. John Gordon and Washington Bullard also served as steamboat clerks for a number of years.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	105,515.00
" " " 1891	204	111,856 45
" " " 1892	169	45,168.98
" " " 1893	175	99.271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893.	1892.	189 .	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of Navigation	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

MANAGERS of the Lake Carriers' Association, who were almost unanimous in supporting the new rules for lake navigation, regret very much the action of a few of the Buffalo owners, who telegraphed President Cleveland after the bill had passed both houses requesting him not to sign it. This late move on the part of the minority in Buffalo, was, to say the least, unwarranted and unwise, in view of the fact that they had ample opportunity to give expression to opposition to the bill, both in the Lake Carriers' Association and before congressional committees in Washington. It is hardly to be expected, however, that an organization as wide in its scope as the Lake Carriers' Association can at all times move along without difference of opinion, and an unfortunate feature of the present difference has been brought out in criticism of the secretary, Mr. C. H. Keep. Mr. Keep's actions throughout the consideration of this question of rules has been unsatisfactory to some Cleveland members of the association, but it is not at all probable that a simple difference of opinion will result in disruption of the association, or the removal of Mr. Keep on account of hasty utterances from some members who were particularly enthusiastic over the new rules.

IN ANOTHER part of this issue, a correspondent who is at the head of one of the largest ship building plants on the lakes, claims for basic open hearth steel, as used in ship construction, qualities equal to the acid open hearth material. From noting the conclusions of eminent authorities in steel business, and from the fact that two or three of the governments of Europe, where the basic process is better understood than in this country, have prohibited its use in structural work demanding the very best quality of material, the REVIEW has recommended that vessel owners specify acid open hearth steel when making contracts for new vessels. This discussion is welcome, however, and if it is to rightfully change opinion on the subject it will be all the more welcome, as one of the objects in view when the article referred to in the communication was written was to bring out the facts.

IT IS NOW quite probable that the senate will attach to the sundry civil appropriation bill an amendment, introduced by Mr. Vilas, providing for an international commission to make inquiry and report upon the feasibility of a deep-water ship canal to connect the great lakes with the Atlantic ocean. This item in the bill may possibly be opposed by the war department, on account of a limit in the number of army engineers proposed for the commission, but if it is carried and co-operation is secured from the dominion government, the engineers will find many features of the question worthy of careful consideration and the money involved may be profitably expended, though the canal be left for a future generation to build.

THERE is little room for argument adverse to the policy of the United States government letting all contracts for vessels to private ship yards, as against any increase of operations in government yards, and under existing conditions it is not probable that congress will even seriously consider the subject. The greater cost of ships in navy yards is due to the system that admits so much of politics and military red tape. The element of politics, which is the greater evil, does not admit of economy, and the result of the other evil, involving questions of authority between commandants, constructors and other officers, is a disconnected and inefficient organization.

THE SUNDRY civil appropriation bill as it passed the house contained eleven items for new lights and fog signals on the lakes, carrying in all $126,500. Amendments to the bill in the senate add seven items to this number, involving additional appropriations to the amount of $57,200, or $183,700 in all. If this amount is carried by the bill upon final passage, vessel owners will have cause for congratulations, although the sum of appropriations is moderate when the number of aids to navigation authorized for the lakes, but for which no appropriations have been made, is taken into consideration.

M. E. Ingalls on the Question of Free Ships.

M. E. Ingalls, who is at the head of the Big Four and Chesapeake & Ohio railways, is known to hold decided views in opposition to the government policy prohibiting the purchase of foreign built ships, but unlike other free ship advocates he favors subsidies. He spoke on this subject at the meeting in Cincinnati a few days ago, at which a national organization of manufacturers was formed. Mr. Ingalls recently had built in England a fleet of six freight steamers, which are now in operation between Liverpool and Newport News, Va., connecting at the latter place with the Chesapeake & Ohio Railway. These ships are supposed to be controlled by an English corporation, but they are in reality the property of the Chesapeake & Ohio company. This fact must be taken into account in connection with anything Mr. Ingalls has to say on the subject of free ships. At Cincinnati he talked of means to improve trade with South American countries, and this is what he said on the shipping features of his subject:

"Certain and frequent communications with the countries of South America require regular lines of ships. The first trouble in establishing these is that under your laws in this country you cannot buy ships, and if you attempt to build them they cost you about 30 per cent. more than you can buy them for abroad, and at the first start you are at a disadvantage with your English competitor. A vessel which can be bought for $200,000 on the Clyde will cost in this country from $250,000 to $300,000, and under our laws, if your merchant or your people buy a vessel there, it must be sailed under the British flag. You cannot bring it to this country and sail it under the American flag. Can you tell me of anything else that is protected so viciously as this? There is nothing, except counterfeit money and obscene literature. Why in the world if we wish to build up our commerce should we not have the right to buy ships anywhere on earth where we can buy them the cheapest, register them and sail them under the American flag? If you want, you might charge a duty upon them like you do upon other importations; but to absolutely prohibit their purchase seems to me to defeat our hope of getting a marine service. If the world were open to us to buy vessels, very soon we would get back our own carrying trade and a portion of that of other nations. In order to maintain a regular service you must have a contract with the United States government for carrying the mail, and the price of that must be largely in excess of the ordinary payments, or, in other words, you must have large subsidies. If we could get a company in this country that would build steamships to run to all the leading ports of South America; if the government would contract for a term of years for a large subsidy, it would aid our trade with South America more than anything else that can be done. England for forty years paid out over $6,000,000 each year in subsidies to establish communication with India, Australia, Canada and South America, and to-day is spending something like $4,000,000 every year for that purpose. If this government would put $1,000,000, a year into steamship service between the Atlantic and Pacific ports and the ports of South America, we should revolutionize the trade between these countries. We have the best system of railway transportation in the world for our internal commerce, and it has been largely built up and developed by a system of subsidies; and why should not we adopt the same principle for building up our merchant marine and our transportation to other countries?"

Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

533,459. Electrically Lighted Buoy. Ira W. Henry, New York, N. Y. Filed May 29, 1893 Serial No. 475,828.

Claim. A buoy having mounted thereon an electric lamp or lamps, and a water-proof transformer for delivering to said lamp or lamps a low potential current from an alternating circuit, the leads to said circuit being housed in a groove or recess formed in the buoy and provided with a water-proof cover.

533,465. Mariners' Compass. John A. Hooper, Boston, Mass., Filed Mar. 2, 1894. Serial No. 502,059.

Claim. In a compass the combination with the card spindle of a pair of jaws adapted to clasp the lower end of the card spindle and a lever and connections between said lever and jaws. The body A, bottom *a*, provided with two expansive chambers N. H, the card G, and spindle *g*, in combination with a pair of jaws *j*, *j*, a tube attached to the expansive chamber N, a spring L and a lever P for operating the expansive chamber N, and connection between same and the jaws.

533,668. Anchor. Charles R. Reeves, Fitchburg, Mass. Filed Nov. 17, 1894. Serial No. 529,129.

Claim. An anchor comprising the head B provided with the radial flukes B′, the joined shank A A′, the portion A thereof being secured to the head and being provided with a check-ring D and the portion A′ thereof being provided at its free end with the ring K and the double looped ring E E′ secured loosely on the portion A of the shank between said head and check-ring, and the rope or warp chain H extending from said double looped ring E E′ through said ring K.

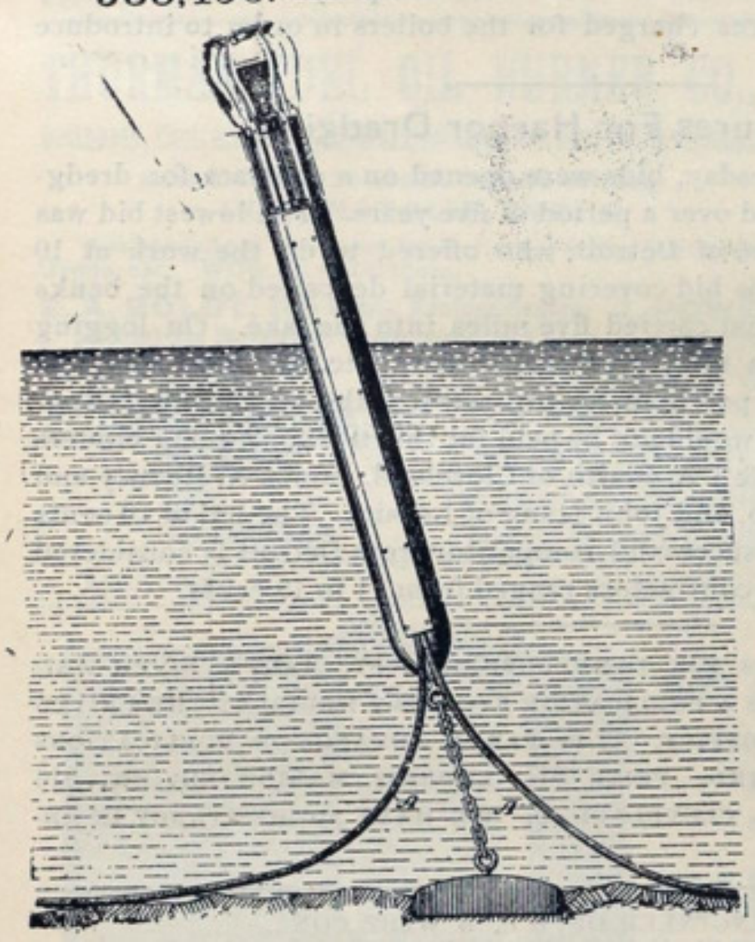
533,740. Dredging Apparatus. William B. Pless, Stockton, Cal., assignor to the Pless Dredging and Reclamation Company, of Neveda. Filed Feb. 16, 1894. Serial No. 500,345.

Claim. In combination with a dredge boat having a swinging boom, a suspended bucket composed of two hinged jaws, a power cylinder and plunger, a hollow shaft upon which the jaws are hinged and the cylinder mounted, and a flexible pipe connected to said hollow shaft and extending to the dredge boat. A dredger bucket composed of two quadrant shaped jaws forming when closed a hollow hemi-spherical receptacle, and hinged or pivoted at both ends upon a common shaft, in combination with a power cylinder mounted upon said shaft and extending above it, links connecting the plunger of said cylinder with the jaws of the bucket, and means for supplying water to the cylinder whereby the upward motion of the plunger transmitted through the said links closes the jaws of the bucket.

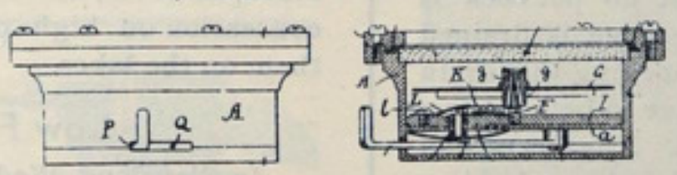
533,810. Oar. Charles O. Hodges and George H. Gardner, Batavia, N. Y. Filed April 21, 1894. Serial No. 508,486.

Claim. In a bow facing oar, the combination, with a rocking frame adapted for attachment to the gunwale of a boat, and tubular arms pivotally connected with the said frame and rocking therewith, of an oar comprising a handle section and a combined body and blade section, a rod secured to each section of the oar, one rod being passed loosely through each tubular arm, the rods being coupled together at their opposing ends, and links pivotally connected one with each tubular arm, the said links being pivotally connected at their opposite ends and having guided movement upon the rocking frame, whereby when the handle section is turned the body section of the oar will be turned also and whereby both sections of the oar will be compelled to move simultaneously in the same direction.

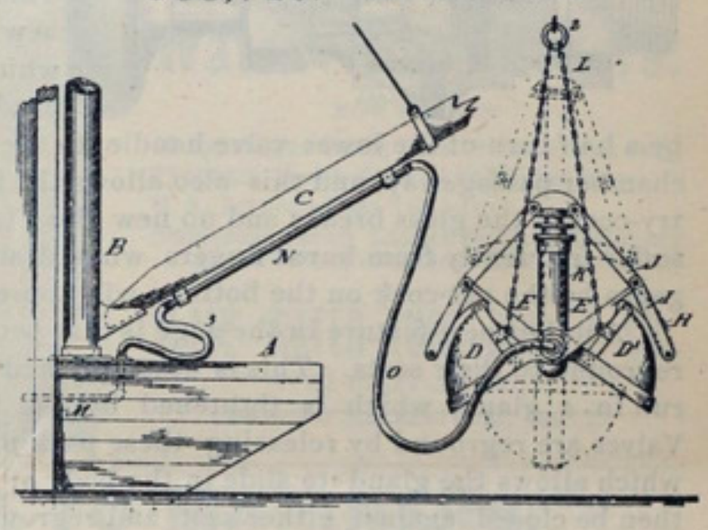
533,459. ELECTRICALLY-LIGHTED BUOY



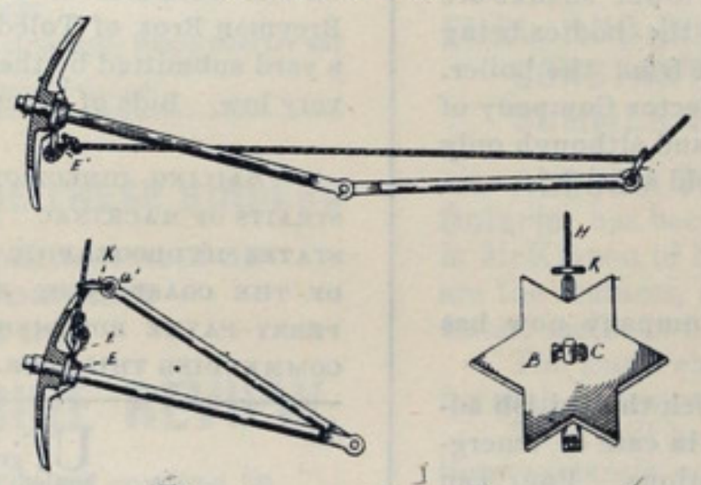
533,465. MARINER'S COMPASS



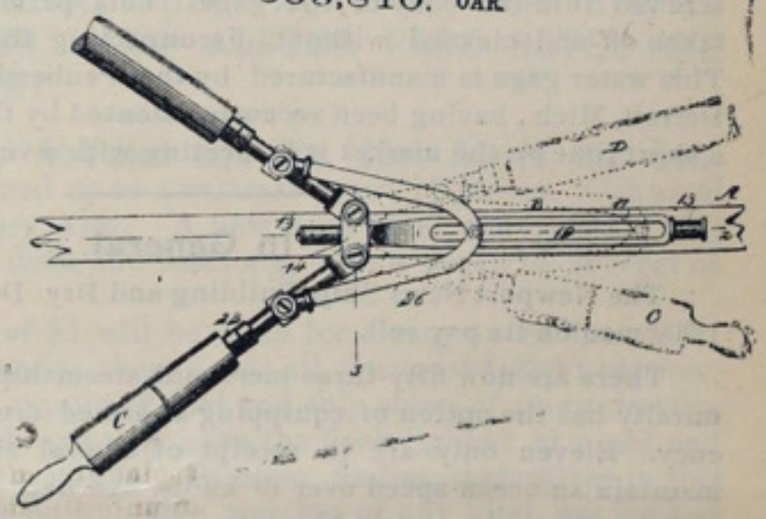
533,740. DREDGING APPARATUS.



533,668. ANCHOR



533,810. OAR.



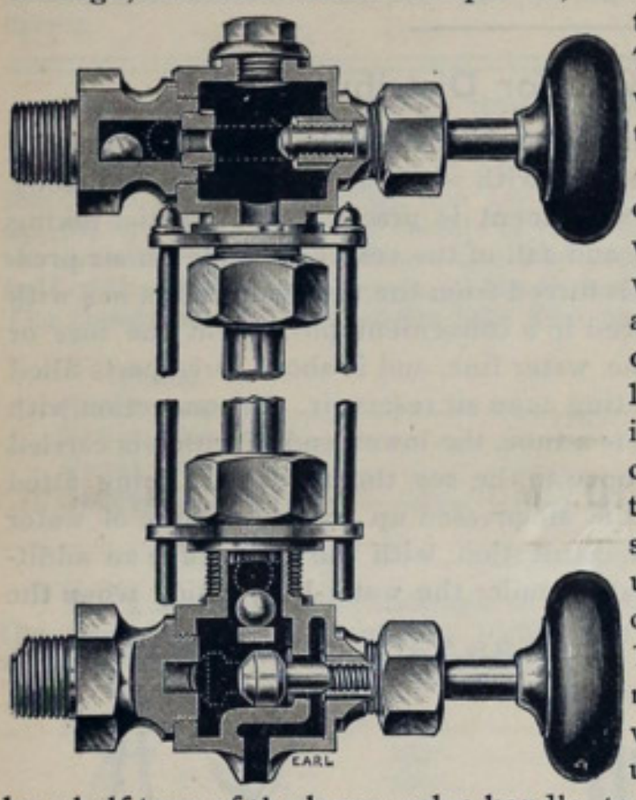
Successful Device for Distributing Oil.

A Glasgow firm recently introduced a simple device for distributing oil in rough weather that is meeting with adoption quite generally among British ship owners. The arrangement is practically automatic, taking advantage as it does of the rise and fall of the vessel to create an air pressure by means of which the oil is forced from the reservoir and mixes with the sea. Briefly, a tank is placed in a convenient position at the fore or after end of the vessel above the water line, and is about three-parts filled with oil, the remaining space acting as an air reservoir. In connection with and passing through this tank is a tube, the lower end of which is carried as far down as possible, and is open to the sea, the upper part being fitted with an air valve to admit of the air pressed up by the column of water passing into the reservoir. In connection with the main tube an additional air tube is fitted immediately under the water-line, which when the vessel rises, admits air into the main tube, and by means of a valve prevents its escape. This air is acted upon by the column of water which forces its way up the main tube by the pitching of the vessel, and a pressure of 5 pounds to 6 pounds can easily be obtained, which, acting upon the air stored in the reservoir, ejects the oil through the distributing pipes to the sea.

A twin-screw steamer of 6,500 tons dead-weight capacity for the Cunard line, to engage in the freight and cattle trade between Liverpool, New York and Boston, was launched a few days ago by the London and Glasgow Engineering and Iron Ship Building Company of Govan, Scotland. This vessel with another now on the stocks will form the nucleus of what is expected will grow into a large fleet of steamers. She is named Sylvania, and is 460 feet over all, 49 feet beam and 42 feet 6 inches to shelter deck. Although a cargo steamer, the vessel is to attain a speed of 14½ knots. There are two sets of triple expansion engines, having cylinders 22½ inches, 36½ inches and 60 inches in diameter by 48 inches stroke, and two large double-ended boilers fitted with Howden's hot draught.

An Improved Automatic Water Gage.

An automatic water gage containing several new features is illustrated herewith. This gage closes automatically by means of two ball valves, which fly at once to their seats upon the breaking of the gage glass, effectually closing the gage against both water and steam. One new feature in the device is that of turning the handle of the upper valve as far to the left as possible, bringing the valve stem out of line with the glass; then upon removing the cap from top of gage, the glass is dropped through, nuts and washers are put on, and the glass drops to its seat in the lower part of the gage. The gage is again put into service by first closing both valves to their seats against the boiler, as shown by dotted lines in the cut, then opening the lower valve about half a turn, when water will show in the glass; after which the upper valve is opened slowly and then the lower valve is opened full until it seats against the drain cock chamber. It will be seen that the lower valve is double-faced, seating against the boiler pressure and also against the drain cock chamber to the right. This brings out the second new feature in this water gage, which is that no pet cock is used, but the gage is drained by a half turn of the lower valve handle to the right, opening the drain chamber passageway, and this also allows the lower valve to be used as a try-cock if the glass breaks and no new glass is at hand. Engineers who suffer frequently from burnt fingers when draining old-fashioned water gages by the pet-cock on the bottom, will appreciate this improvement.



Another new feature in the gage is that permitting of the valves being reground to their seats. This is accomplished by having the valve stem run in a gland, which is tightened by the packing nut of the stem. Valves are reground by releasing these packing nuts about three turns, which allows the gland to slide in the body of the gage. The valve can then be closed against either seat and reground by simply turning the handle back and forth a few times. Both upper and lower shanks are screwed into the body of the gage. This permits of the bodies being taken off and cleaned without disconnecting the gage from the boiler. This water gage is manufactured by the Penberthy Injector Company of Detroit, Mich., having been recently patented by them, and although only a short time on the market it is meeting with a very rapid sale.

In General.

The Newport News Ship Building and Dry Dock Company now has 1,900 men on its pay roll.

There are now fifty-three merchant steamships which the British admiralty has the option of equipping as armed cruisers in case of emergency. Eleven only are in receipt of annual subventions. Four can maintain an ocean speed over 19 knots, five over 17, thirty-seven over 15, and the remainder nearly 15 knots.

It was our pleasure to meet, before the committee on marine and fisheries at the capital recently, about twenty lake shipmasters who were there from the lakes to look after their interests in congress. After listening to their arguments on the question of fog signals, in which each took a part, we were surprised at the fine oratory and the lucid manner in which they presented their case to the committee. After becoming better acquainted with these gentlemen, we found several among them who had served in packet ships crossing the Western ocean, and who have since improved their minds as well as their bank accounts as fresh water sailors. It has never been our luck to fall in with a better informed body of men who were mariners by occupation.—Marine Journal.

Miscellaneous Mention.

Wm. Evans of Deseronto is now one of the Canadian inspectors of hulls. He has been appointed to succeed Capt. Harbottle, deceased.

Editor C. S. Osborne of the Sault St. Marie News, who numbers quite a few lake men among his friends, has been appointed state game warden in Michigan.

Frank E. Kirby and Gilbert N. McMillan of the Detroit Dry Dock Company have returned from their European trip. They arrived in New York Saturday and are now in Detroit.

Buffalo elevator managers are again trying to break away from methods of the grain shovelers' union, and an effort is being made to contract for all labor of this kind connected with the grain business, after the method followed in handling package freight.

Net earnings of the Richelieu & Ontario Navigation Company (St. Lawrence river line) are reported to have amounted in 1894 to $164,000, or about 11½ per cent. of the capital. The amount carried to profit and loss is $43,000, after allowing for interest and fixed charges and paying a 6 per cent. dividend. The net earnings for 1893 wers $27,287.

James Powell of the William Powell Company, Cincinnati, a firm well known to lake ship builders, has an interesting article in the initial number of the Ohio Valley Industrial Review on the Manufacture of Brass and Bronze Goods. Cincinnati probably manufactures a greater variety of brass goods than any city in the country.

H. W. Hubbell of Saginaw, who has been engaged on dredging contracts on the Sault river for some time past, was in Cleveland, Wednesday, with representatives of the dredging companies who were bidding on harbor work let by the city. Mr. Hubbell is rebuilding a dredge in Saginaw this winter. He has a repair yard at that point.

The Brown Hoisting and Conveying Company of Cleveland has taken up the construction of a new type of car dumping machine, and under a contract with Morris, Ellsworth & Co., who are among the leading Cleveland shippers of lake coal, a plant will be erected at Ashtabula in time for service early next season. The machine dumps the car sidewise into buckets.

Officers of the Lake Michigan & Lake Superior Transportation Company considered the question of fitting their steamer Manitou with Babcock and Wilcox tubulous boilers before deciding to replace the gunboat boilers now in the Manitou by boilers of the Scotch type. It is understood, however, that the Babcock and Wilcox company is not making any concession on high prices charged for the boilers in order to introduce them on the lakes.

Low Figures For Harbor Dredging.

In Cleveland, Wednesday, bids were opened on a contract for dredging in the river to extend over a period of five years. The lowest bid was that of George Lockerbie of Detroit, who offered to do the work at 10 cents per cubic yard, this bid covering material deposited on the banks of the river, as well as that carried five miles into the lake. On logging work, which includes the towing of snags, roots, etc., into the lake, the bids were uniformly $8 per hour for tug service, the city having stipulated that a higher price would not be paid for this work. Among bidders on this work were L. P. & J. A. Smith of Cleveland, James A. Rooney and Breyman Bros. of Toledo, and John Stang of Lorain. The bid of 10 cents a yard submitted by the successful competitor from Detroit is considered very low. Bids of other contractors ranged from 14 to 19 cents.

U. S. ENGINEER OFFICE, 34 WEST CONgress St., Detroit, Mich., January 30, 1895. Sealed proposals for furnishing all labor, materials and appliances for A, Removing Portions of a Shoal at the Upper End of Hay Lake Channel and for B, Cleaning up Shoals near Nine Mile Point, Hay Lake Channel will be received here until 2 p.m. March 1, 1895, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application. O. M. POE, Col., Corps of Engineers. U. S. A., etc. Feb. 21.

OFFICE OF LIGHT-HOUSE ENGINEER, 9th and 11th District, Detroit, Mich., Feb. 11, 1895. Sealed proposals will be received at this office until 3 o'clock P. M., on Saturday, the 2d day of March, 1895, for furnishing the boilers for ten steam fog signals, in sets of two, delivered at the light-house depot at Detroit, Michigan. Plans, specifications, forms of proposals, and other information may be obtained on application to the undersigned. The right is reserved to reject any or all bids and to waive any defect. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light-House Engineer. 14-21

U. S. ENGINEER OFFICE, HICKOX Building, 185 Euclid avenue, Cleveland, Ohio, Feb. 1, 1895. Sealed proposals for removing and rebuilding a part of west pier at Fairport harbor, Ohio, will be received here until 2 o'clock p. m., standard time, Friday, March 1, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lieut. Col. of Engineers. 2-22

U. S. ENGINEER OFFICE, HICKOX Building, 185 Euclid avenue, Cleveland, Ohio, Feb. 1, 1895. Sealed proposals for dredging in Straight Channel through Maumee bay, Toledo harbor, Ohio, will be received here until 2 o'clock p. m., standard time, Friday, March 1, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lt. Col. Eng'rs. 2-22

MARINE REVIEW LINER EXCHANGE.

Space under this heading may be used gratis by our advertisers or subscribers to call attention to vessels or any craft, machinery, new or second hand, that they may have for sale. Those wanting machinery of any kind or wishing to purchase vessels, are invited to take advantage of the same offer. Employers in need of professional men or men who want positions may avail themselves of the opportunities offered. Each item will be limited to three lines. Letters concerning same must mention number attached to item and be addressed MARINE REVIEW, 516 Perry-Payne Building, Cleveland, O.

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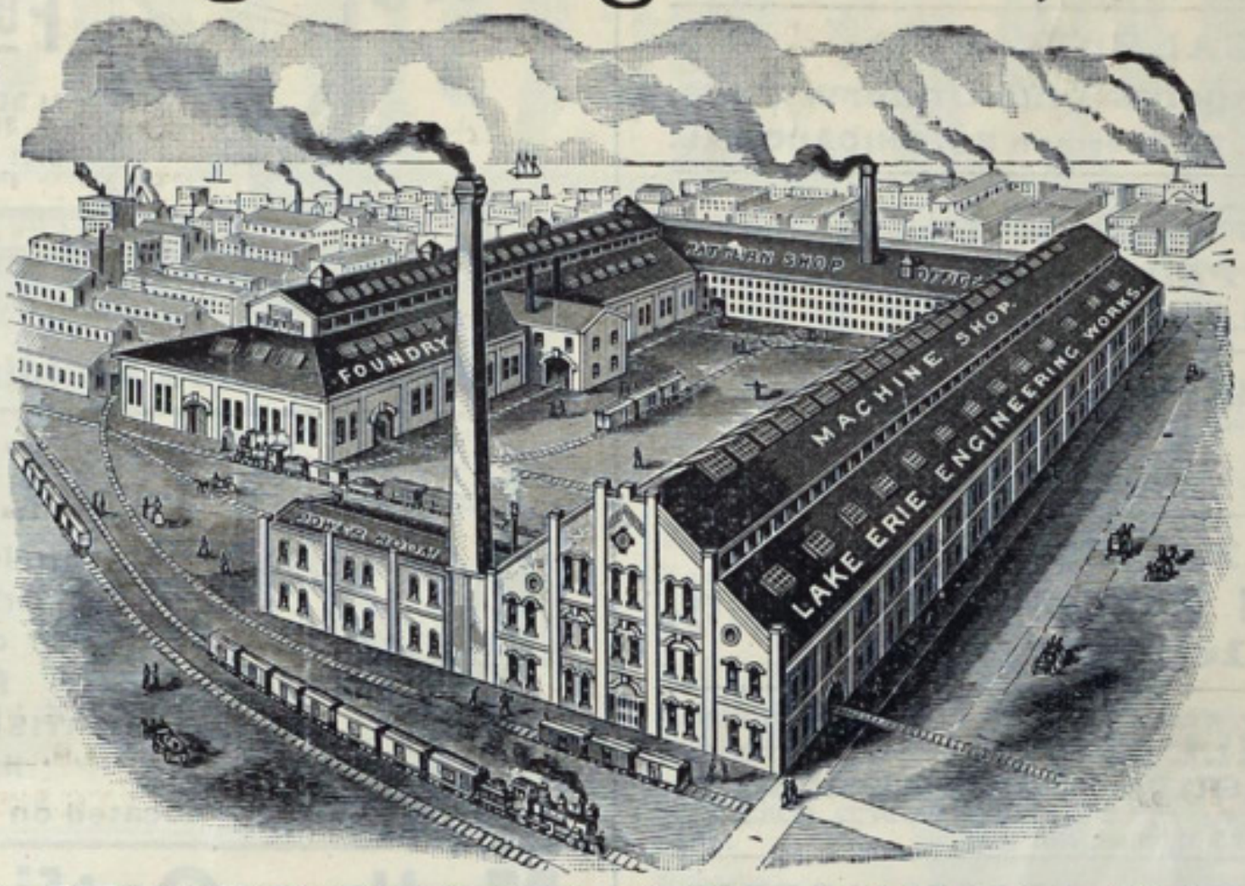

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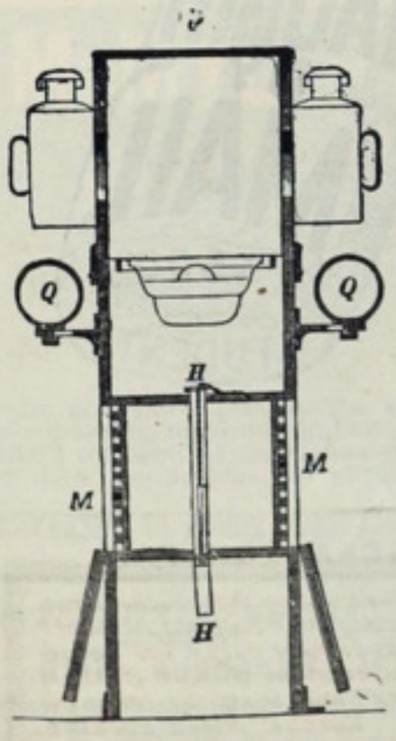

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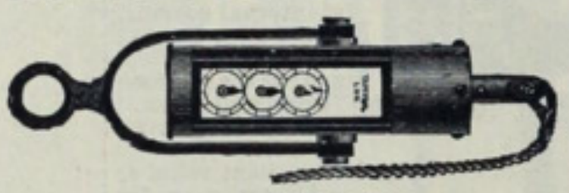
..TAFFRAIL LOG..



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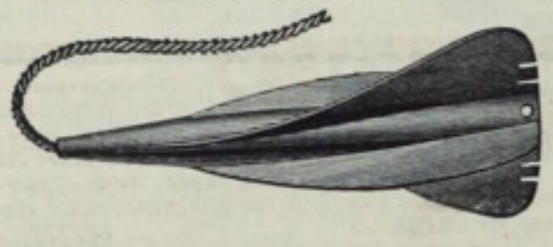

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